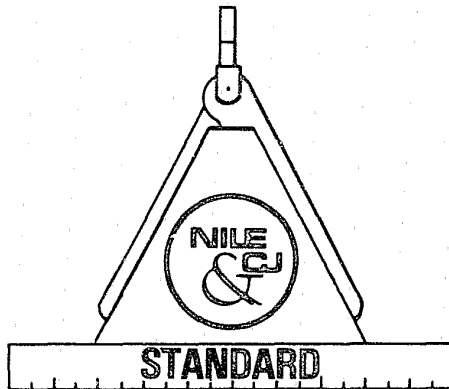


NILECJ-STD-0604.00
DECEMBER 1978

LAW ENFORCEMENT STANDARDS PROGRAM

**CHEMICAL SPOT TEST KITS FOR
PRELIMINARY IDENTIFICATION OF
DRUGS OF ABUSE**



47379

**U.S. DEPARTMENT OF JUSTICE
Law Enforcement Assistance Administration
National Institute of Law Enforcement and Criminal Justice**



LAW ENFORCEMENT STANDARDS PROGRAM

**NILECJ STANDARD
FOR
CHEMICAL SPOT TEST KITS FOR
PRELIMINARY IDENTIFICATION OF
DRUGS OF ABUSE**

**A Voluntary National Standard Promulgated by the
National Institute of Law Enforcement and Criminal Justice**

DECEMBER 1978

**U.S. DEPARTMENT OF JUSTICE
Law Enforcement Assistance Administration
National Institute of Law Enforcement and Criminal Justice**

**NATIONAL INSTITUTE OF LAW ENFORCEMENT
AND CRIMINAL JUSTICE**

Blair G. Ewing, Acting Director

**LAW ENFORCEMENT ASSISTANCE
ADMINISTRATION**

James M. H. Gregg, Acting Administrator

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This standard was formulated by the Law Enforcement Standards Laboratory of the National Bureau of Standards under the direction of Robert M. Mills, Manager, Investigative Aids Program, and Jacob J. Diamond, Chief of LESL. Technical research was performed by the staff of the NBS Analytical Chemistry Division under the supervision of Dr. Rance A. Velapoldi. The standard has been reviewed and approved by the National Advisory Committee for Law Enforcement Equipment and Technology of the International Association of Chiefs of Police and adopted by them as an IACP standard.

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FOREWORD

Following a Congressional mandate¹ to develop new and improved techniques, systems, and equipment to strengthen law enforcement and criminal justice, the National Institute of Law Enforcement and Criminal Justice (NILECJ) has established the Law Enforcement Standards Laboratory (LESL) at the National Bureau of Standards. LESL's function is to conduct research that will assist law enforcement and criminal justice agencies in the selection and procurement of quality equipment.

In response to priorities established by NILECJ, LESL is (1) subjecting existing equipment to laboratory testing and evaluation and (2) conducting research leading to the development of several series of documents, including national voluntary equipment standards, user guidelines, state-of-the-art surveys and other reports.

This document, NILECJ-STD-0604.00, Chemical Spot Test Kits for Preliminary Identification of Drugs of Abuse, is a law enforcement equipment standard developed by LESL and approved and issued by NILECJ. Additional standards as well as other documents will be issued under the LESL program in the areas of protective equipment, communications equipment, security systems, weapons, emergency equipment, investigative aids, vehicles and clothing.

This equipment standard is a technical document consisting of performance and other requirements together with a description of test methods. Equipment which can meet these requirements is of superior quality and is suited to the needs of law enforcement agencies. Purchasers can use the test methods described in this standard to determine firsthand whether a particular equipment item meets the requirements of the standard, or they may have the tests conducted on their behalf by a qualified testing laboratory. Law enforcement personnel may also reference this standard in purchase documents and require that any equipment offered for purchase meet its requirements and that this compliance be either guaranteed by the vendor or attested to by an independent testing laboratory.

The necessarily technical nature of this NILECJ standard, and its special focus as a procurement aid, make it of limited use to those who seek general guidance concerning chemical spot test kits. The User Guide Series is designed to fill that need. We plan to issue guides to various items of law enforcement equipment as soon as possible, within the constraints of available funding and the overall NILECJ program.

The user guides being issued are highly readable and tutorial in nature in contrast to the standards, which are highly technical and intended for laboratory use by technical personnel. The guides provide, in non-technical language, information for purchasing agents and other interested persons concerning the capabilities of equipment currently available. They may then select equipment appropriate to the performance required by their agency. Recommendations for the development of particular guides should be sent to us.

NILECJ standards are subjected to continuing review. Technical comments and recommended revisions are invited from all interested parties. Suggestions should be addressed to the Program Manager for Standards, National Institute of Law Enforcement

¹ Section 402(b) of the Omnibus Crime Control and Safe Streets Act of 1968, as amended.

and Criminal Justice, Law Enforcement Assistance Administration, U.S. Department of Justice, Washington, D.C. 20531.

LESTER SHUBIN
Program Manager for Standards
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NILECJ STANDARD FOR CHEMICAL SPOT TEST KITS FOR PRELIMINARY IDENTIFICATION OF DRUGS OF ABUSE

1. PURPOSE

The purpose of this standard is to establish minimum requirements for chemical spot test kits and methods of testing the kits to determine compliance with those requirements.

2. SCOPE

This standard applies to field testing kits which use chemical spot tests for the preliminary identification of drugs of abuse (hereinafter referred to simply as drugs). It does not apply to kits which use thin layer chromatography as the identification procedure nor to kits which identify drugs in body fluids.

Note that this standard does not mandate the identities of the reagents to be included in a test kit. The eleven reagents listed in appendix A and their color reactions as listed in table 1 are included only as a convenience, since they are among the reagents currently in most common use. A kit may contain any reagent or group of reagents that meet the requirements of this standard.

3. DEFINITIONS

3.1 Centroid Color Charts

A collection of charts, published by the Inter-Society Color Council and the National Bureau of Standards, which logically group and illustrate the colors. There is a chart for each color hue. On each chart, color saturation increases from left to right and color lightness increases from bottom to top. The charts are identified as NBS Standard Reference Material 2106 and are described in NBS Circular 553. The charts may be purchased from the Office of Standard Reference Materials, and the circular may be obtained from the Office of Technical Publications, both at the National Bureau of Standards, Washington, D.C. 20234.

3.2 Color Vicinity

Those colors, other than the greys, which are the same as or are adjacent to the referenced color in a Centroid Color Chart. For example, colors in the color vicinity of number 15 on the Red-Pink chart are numbers 3, 6, 12, 13, 15, 16, 18, 19 and 20.

3.3 Final Color

The color remaining after any intermediate colors, produced by the addition of a reagent to a drug or other substance, have disappeared.

4. REQUIREMENTS

4.1 User Information

The kit shall include the following information.

4.1.1 Drugs Detected

A list of the drugs for which the reagents in the kit can be used to make a tentative identification with acceptable specificity. This list shall consist of those drugs listed on the reagent containers in accordance with 4.2.b.

4.1.2 Instructions

Clear instructions for performing the chemical spot tests and for interpreting the results.

4.1.3 Safety Precautions

- a) Warning of the hazards of the flammable and corrosive chemicals contained in the kit.
- b) Steps to follow and antidotes to use if hazardous reagents are taken internally or come in contact with parts of the body or clothes.
- c) Procedures for safely discarding used reagents and containers.

4.1.4 General

- a) A statement that the kit is intended to be used for presumptive purposes only, and should not be used for evidential purposes unless the results are verified by a qualified forensic scientist in a properly equipped crime laboratory.
- b) A statement that users of the kit should receive appropriate training in its use, and should be taught that the kit can give false positive as well as false negative results.
- c) A discussion of cleaning and the use of clean apparatus to decrease the probability of reagent contamination and misleading results.
- d) A discussion of proper kit storage in buildings and vehicles.

4.2 Labeling

Each reagent container shall have a label which either directly or by reference:

- a) Identifies the reagent.
- b) Identifies the drug or drugs which it can detect.
- c) Is prominently marked "Danger," where appropriate.
- d) Gives a discard date, where appropriate. Serial numbers, if printed on the labels, satisfy this requirement (4.2.d) if discard dates corresponding to those serial numbers are given elsewhere in the kit.

4.3 Workmanship

Visual inspection of the kit shall show no broken or inoperative catches, hinges or containers. There shall be no evidence of reagent leakage.

4.4 Safe-Disposal Materials

The kit shall contain chemicals for neutralizing strongly acidic and basic reagents and/or acid/base resistant containers into which used reagents and containers can be deposited and safely disposed of at a later time in accordance with 4.1.3.c.

4.5 Color Samples

4.5.1

The kit shall include samples or reproductions of the final colors produced by each reagent in the kit when reacted with each drug listed on the reagent container label.

4.5.2 If Reagent is Listed in Appendix A

For each reagent in the kit which is listed in appendix A, the color samples shall be in the color vicinity of the appropriate final color listed in table 1, when matched in accordance with 5.2.

4.5.3 If Reagent is Not Listed in Appendix A

For each reagent in the kit which is not listed in appendix A, the color samples shall be in the color vicinity of the color specified by the manufacturer in accordance with 4.6.2, when matched in accordance with 5.2.

4.6 Final Color

4.6.1 If Reagent is Listed in Appendix A

Each reagent in the kit which is listed in appendix A shall produce a final color which is in the color vicinity of the appropriate final color listed in table 1, when tested in accordance with 5.3.

4.6.2 If Drug/Reagent Combination is Not Listed in Table 1

The manufacturer shall specify the Centroid Color Chart color which most nearly matches the final color of each drug/reagent combination listed on a reagent container label, but not included in table 1.

4.6.3 If Reagent is Not Listed in Appendix A

Each reagent in the kit which is not listed in appendix A shall produce final colors which are in the color vicinity of the final colors specified in accordance with 4.6.2, when tested in accordance with 5.3.

4.7 Sensitivity

4.7.1

Each reagent in the kit shall produce a final color which is either in the color vicinity of, or has the same color hue and color saturation as the final color listed in table 1 or specified in accordance with 4.6.2, for each of five replicate tests, performed in accordance with 5.4 at the drug detection limit listed in table 2 or specified by the manufacturer in accordance with 4.8.

4.8 Detection Limit

The manufacturer shall specify the drug detection limit, determined in accordance with 5.5, for each drug/reagent combination listed on a reagent container label, other than those listed in table 2. For any drug listed in table 3, the limit shall not exceed that listed in table 3.

4.9 Specificity

The kit shall include sufficient reagents to permit differentiation between each drug

listed in accordance with 4.1.1 and the other substances listed in table 4. The differentiation may be accomplished by the use of a single reagent, or by a combination of reagents. Acceptable differentiation occurs if the final colors of the tests are not in the color vicinity of one another when checked in accordance with 5.6.

5. TEST METHODS

5.1 General Test Conditions

At the time of the tests, the ambient temperature shall be between 10°C and 40°C (50°F and 104°F); the relative humidity shall be between 10 and 90 percent.

5.2 Color Sample Test

Visually compare each color sample in the kit with the colors in the Centroid Color Charts, and determine whether the color in the Centroid Color Charts which most nearly matches is in the color vicinity of the appropriate final color.

5.3 Final Color Test

5.3.1 Drug Selection

Select drugs as follows for the determination of the final colors developed by the reagents:

5.3.1.1

For each reagent in the kit which is listed in appendix A (except A.5), select any drug listed on the reagent container label which is also listed in table 1 and asterisked.

5.3.1.2

If reagent A.5 is in the kit, select one drug from each of the three following groups:

Group I: Codeine Sulfate, Heroin.HCl, Morphine.

Group II: D-Amphetamine.HCl, D-Methamphetamine.HCl, Mescaline Sulfate.

Group III: Any other drug listed on the reagent container label.

5.3.1.3

Test each reagent in the kit other than those listed in appendix A with each drug listed on the reagent container label.

5.3.2 Reference Final Color

Find in the Centroid Color Charts the appropriate final color listed in table 1, or the color specified, in accordance with 4.6.2, by the manufacturer.

5.3.3 Test Procedure

Place in the test container an amount of the pure drug which is between one and ten times the drug detection limit but no less than 25 μg .

5.3.4

Add reagents in the specified volume and order, or break sealed glass tubes in

accordance with the kit instructions. Note the final color, which in almost all cases will be produced within two minutes after the last reagent is added.

5.3.5

Compare the final colors produced to those in the Centroid Color Charts, and determine the color in the Centroid Color Charts which most nearly matches.

5.3.6

Determine whether the Centroid Chart color referenced in 5.3.5 is in the color vicinity of the color referenced in 5.3.2.

5.3.7

If either 4.6.1 or 4.6.3 is not satisfied, check the drug solution and test procedure by repeating 5.3.3 through 5.3.6 using fresh reagent prepared as directed in appendix A or by the manufacturer. This paragraph (5.3.7) is not applicable for reagents not listed in appendix A unless information similar to that in appendix A is supplied by the manufacturer.

5.4 Sensitivity Test

5.4.1

Use the same drugs for sensitivity testing of each reagent in the kit as for the final color test (5.3).

5.4.2

For marijuana, transfer a quantity equal to the drug detection limit into each of five test containers and proceed to 5.4.6.

5.4.3

Prepare 1.0 $\mu\text{g}/\mu\text{l}$ solutions of the other selected drugs in reagent grade solvents. Chloroform and distilled water are convenient solvents for the drugs listed in table 2, as indicated.

5.4.4

For each drug, transfer by micropipette into each of five test containers the volume of drug solution, in μl , numerically equal to the drug detection limit, in μg , listed in table 2 or specified by the manufacturer in accordance with 4.7.2.

5.4.5

Evaporate the solvent by infrared heating and/or by gently blowing a stream of gas such as oil-free air, nitrogen, helium, etc., over the surface of the solution. Keep heating time to a minimum by heating only until the solvent is evaporated, to avoid the possibility of drug decomposition. The temperature of the solution should not exceed 40°C (104°F) during solvent evaporation.

5.4.6

Add reagents in the specified volumes and order, or break sealed glass tubes in accordance with the kit instructions.

5.4.7

If one or more of the five replicate tests results in a final color which is not in accordance with 4.7.1, check the drug solution and test procedure by repeating 5.4.4 (5.4.2 for marijuana) through 5.4.6 using fresh reagents prepared as directed in appendix A or by the manufacturer. This paragraph is not applicable for reagents not listed in appendix A unless information similar to that in appendix A is supplied by the manufacturer.

5.5 Detection Limit Determination

Prepare a solution, using a suitable reagent grade solvent, having a drug concentration of 1.0 $\mu\text{g}/\mu\text{l}$, or lower if necessary. Using a micropipette, transfer 5 samples of a convenient volume of this solution to the test plates. Evaporate the solvent and add reagent, as in 5.4.5 and 5.4.6. Change the quantity of drug transferred to the test plate by varying either the solution concentration or the volume transferred, and repeat the test until the smallest mass of transferred drug is determined, to one significant figure, for which five out of five color changes are observed. As a safety factor, multiply this quantity by ten, and use the product as the operational drug detection limit.

5.6 Specificity Test

5.6.1

For each reagent in the kit other than those listed in appendix A, determine the final color, if any, when mixed with each substance listed in table 4.

5.6.2

Determine whether the drugs listed in accordance with 4.1.1 can be differentiated from each other and from the other substances listed in table 4 by the use of one or more of the reagents in the kit. To make this determination, use the information given in tables 1 and 4 for reagents listed in appendix A and the data obtained in accordance with 4.6.2 and 5.6.1 for reagents not listed in appendix A, or drug/reagent combinations not listed in table 1.

APPENDIX A—REAGENTS

Use reagent grade chemicals.

A.1 Cobalt (II) Thiocyanate

Dissolve 2.0 grams (g) of cobalt (II) thiocyanate in 100 milliliters (ml) of distilled water.

A.2 Dille-Koppanyi Reagent, Modified

Solution A. Dissolve 0.1 g of cobalt (II) acetate dihydrate in 100 ml of methanol. Add 0.2 ml of glacial acetic acid and mix.

Solution B. Add 5 ml of isopropylamine to 95 ml of methanol.

Procedure. Add 2 volumes of solution A to the drug, followed by 1 volume of solution B.

A.3 Duquenois-Levine Reagent, Modified

Solution A. Add 2.5 ml of acetaldehyde and 2.0 g of vanillin to 100 ml of 95% ethanol.

Solution B. Concentrated Hydrochloric Acid.

Solution C. Chloroform.

Procedure. Add 1 volume of solution A to the drug and shake for 1 minute. Then add solution B. Agitate gently, and determine the color produced. Add 3 volumes of solution C and note whether the color is extracted from the mixture of A and B.

A.4 Mandelin Reagent

Dissolve 1.0 g of ammonium vanadate in 100 ml of concentrated sulfuric acid.

A.5 Marquis Reagent

Carefully add 100 ml of concentrated sulfuric acid to 5 ml of 40% formaldehyde (v : v, formaldehyde : water).

A.6 Nitric Acid

Concentrated.

A.7 Para-Dimethylaminobenzaldehyde (p-DMAB)

Add 2.0 g of p-DMAB to 50 ml of 95% ethanol and 50 ml of concentrated hydrochloric acid.

A.8 Ferric Chloride

Dissolve 2.0 g of anhydrous ferric chloride or 3.3 g of ferric chloride hexa-hydrate in 100 ml of distilled water.

A.9 Froehde Reagent

Dissolve 0.5 g of molybdic acid or sodium molybdate in 100 ml of hot concentrated sulfuric acid.

A.10 Mecke Reagent

Dissolve 1.0 g of selenious acid in 100 ml of concentrated sulfuric acid.

A.11 Zwikker Reagent

Solution A. Dissolve 0.5 g of copper (II) sulfate pentahydrate in 100 ml of distilled water.

Solution B. Add 5 ml of pyridine to 95 ml of chloroform.

Procedure. Add 1 volume of solution A to the drug, followed by 1 volume of solution B.

TABLE 1. Final colors produced by reagents A.1 through A.11 with various drugs and other substances. (+) means "and/or." Color abbreviations are given at end of table.

Material	Reagent	Final Color (ISCC-NBS)
Benzphetamine	A.1	169. s. g B
Brompheniramine	A.1	168. brill. g B + 177 brill. B
Chlorpromazine · HCl	A.1	168. brill. g B
Cocaine · HCl	A.1*	169. s. g B + 178. s. B
Darvon (propoxyphene · HCl)	A.1	169. s. g B
Demerol · HCl	A.1	169. s. g B
Doxepin · HCl	A.1	169. s. g B
Heroin · HCl	A.1	169. s. g B
Librium	A.1	181. l. B
Marezine (cyclizine · HCl)	A.1	171. v. l. g B
Methadon · HCl	A.1*	181. l. B
Methapyrilene · HCl	A.1	169. s. g B
Opium	A.1	146. d. G
Phencyclidine	A.1	168. brill. g B
Procaine · HCl	A.1*	169. s. g B + 178. s. B
Quinine, Quinine Salts	A.1	178. s. B
Ritalin	A.1	168. brill. g B
Contac	A.2	31. p. y Pk
Pentobarbital	A.2*	218. s. P
Phenobarbital	A.2*	218. s. P
Secobarbital	A.2*	218. s. P
Tea	A.2	29. m. Y Pk
Mace	A.3	237. s. r P ² 237. s. r P ¹ 221. v. l. P ¹
Marijuana	A.3*	197. deep p B ² 186. gy. B ³ 220. v. deep P ¹
Nutmeg	A.3	244. p. r P ² 244. p. r P ³ 226. v. p. P ¹
Tea	A.3	243. v. d. r P ⁵
Aspirin	A.4	113. Ol Gy
Benzphetamine	A.4*	119. l. Y G
Brompheniramine	A.4	50. brill. O
Chlorpromazine · HCl	A.4	107. m. Ol + 13. deep R
Cocaine · HCl	A.4*	51. deep O
Codeine Sulfate	A.4*	107. m. Ol
Contac	A.4	84. s. Y
D-Amphetamine · HCl	A.4*	164. m. b G
D-Methamphetamine · HCl	A.4*	136. m. y G
Darvon (propoxyphene · HCl)	A.4	44. d. r Br
Doxepin · HCl	A.4	21. blackish R
Dristan	A.4	127. gy. Ol G

Material	Reagent	Final Color (ISCC-NBS)
Excedrin	A.4	108. d. Ol
Heroin · HCl	A.4*	43. m. r Br
L-Isomethadon · HCl	A.4	243. v. d. r P
Mace	A.4	46. gy. r Br
MDA · SO ₄ (3,4-methylene-dioxyamphetamine)	A.4	235. p Black
Mescaline Sulfate	A.4*	65. br Black
Methadon · HCl	A.4	183. d. B
Methapyrilene · HCl	A.4	243. v. d. r P + 260. v. d. p R
Methaqualone	A.4	35. s. R O
Methyprylon	A.4	184. v. p. B
Morphine	A.4*	47. d. gy. r Br
Opium	A.4*	94. l. Ol Br
Oxycodone · HCl	A.4	68. s. O Y
Procaine · HCl	A.4	51. deep O
Quinine	A.4	108. d. Ol
Ritalin	A.4	68. s. O Y
Salt, iodized	A.4	51. deep O
STP · HCl (2,5-dimethoxy-4-methylamphetamine)	A.4*	117. s. Y G
TMA · HCl (trimethoxyamphetamine)	A.4*	94. l. Ol Br
Aspirin	A.5	12. s. R
Benzphetamine	A.5*	41. deep r Br
Chlorpromazine · HCl	A.5	260. v. d. p R
Codeine Sulfate	A.5*	212. d. V
D-Amphetamine	A.5*	44. d. r Br + 34. v. r O
D-Methamphetamine · HCl	A.5*	44. d. r Br + 34. v. r O
Darvon (propoxyphene · HCl)	A.5	230. blackish P
Demerol · HCl	A.5	56. deep Br
Doxepin · HCl	A.5	21. blackish R
Dristan	A.5	241. m. r P
Excedrin	A.5	15. m. R
Heroin · HCl	A.5*	239. v. deep r P
LSD Tartrate	A.5	235. p Black
Mace	A.5	244. p. r P
Marezine (cyclizine · HCl)	A.5	98. brill. g Y
MDA · SO ₄ (3,4-methylene-dioxyamphetamine)	A.5*	267. Black
Mescaline Sulfate	A.5*	36. deep r O
Methadon · HCl	A.5	28. l. y Pk
Methapyrilene · HCl	A.5	260. v. d. p R ⁶
Morphine	A.5*	243. v. d. r P
Opium	A.5*	44. d. r Br
Oxycodone · HCl	A.5*	201. d. p Br
Pentobarbital	A.5	78. d. y Br
Phencyclidene	A.5	7. p. P
Phenobarbital	A.5	78. d. y Br
Ritalin	A.5	71. m. O Y
Secobarbital	A.5	78. d. y Br
STP · HCl (2,5-dimethoxy-4-methylamphetamine)	A.5*	101. l. g Y
Sugar	A.5	46. gy. r Br
TMA · HCl (trimethoxyamphetamine)	A.5*	36. deep r O
Chlorpromazine · HCl	A.6	101. l. g Y
Codeine Sulfate	A.6*	101. l. g Y
Doxepin · HCl	A.6	84. s. Y
Excedrin	A.6	68. s. O Y
Heroin · HCl	A.6*	89. p. Y
LSD Tartrate	A.6	54. br O
Mace	A.6	40. s. r Br
MDA · SO ₄ (3,4-methylene-dioxyamphetamine)	A.6	101. l. g Y

Material	Reagent	Final Color (ISCC-NBS)
Mescaline Sulfate	A.6*	41. deep r Br
Methapyrilene · HCl	A.6	44. d. r Br
Morphine	A.6*	67. brill. O Y
Opium	A.6*	101. l. g Y
Oxycodone · HCl	A.6	86. l. Y
STP · HCl (2,5-dimethoxy-4-methylamphetamine)	A.6	89. p. Y
TMA · HCl (trimethoxyamphetamine)	A.6	14. v. deep R
LSD Tartrate	A.7*	219. deep P
Baking Soda	A.8	43. m. r Br
Excedrin	A.8	260. v. d. p R
Morphine	A.8*	67. brill. O Y
Aspirin	A.9	228. gy. P
Chlorpromazine · HCl	A.9	21. blackish R
Codeine Sulfate	A.9*	147. v. d. G
Darvon (propoxyphene · HCl)	A.9	230. blackish P
Doxepin · HCl	A.9	41. deep r Br
Dristan	A.9	163. l. b G
Excedrin	A.9	148. v. p G
Heroin · HCl	A.9*	256. deep p R
LSD Tartrate	A.9	138. v. d. y G
Mace	A.9	257. v. deep p R
Marezine (cyclizine · HCl)	A.9	101. l. g Y
MDA · SO ₄ (3,4-methylene-dioxyamphetamine)	A.9*	157. g Black
Mescaline Sulfate	A.9*	84. s. Y
Methapyrilene · HCl	A.9	65. br Black
Morphine	A.9*	67. brill. O Y
Opium	A.9*	96. d. Ol Br
Oxycodone · HCl	A.9	84. s. Y
Phencyclidine	A.9	7. p. P
STP · HCl (2,5-dimethoxy-4-methylamphetamine)	A.9*	117. s. Y G
TMA · HCl (trimethoxyamphetamine)	A.9*	183. d. Blue
Benzphetamine	A.10*	101. l. g Y
Chlorpromazine · HCl	A.10	111. d. gy. Ol + 108. d. Ol
Codeine Sulfate	A.10*	175. v. d. g B
Darvon (propoxyphene · HCl)	A.10	41. deep r Br
Doxepin · HCl	A.10	21. blackish R
Dristan	A.10	94. l. Ol Br
Excedrin	A.10	93. y Gy
Heroin · HCl	A.10*	161. deep b G
LSD Tartrate	A.10	152. blackish G
L-Isomethadon · HCl	A.10	7. p. Pk
Mace	A.10	111. d. gy. Ol
Marezine (cyclizine · HCl)	A.10	98. brill. g Y
MDA · SO ₄ (3,4-methylene-dioxyamphetamine)	A.10*	183. d. B
Mescaline Sulfate	A.10*	114. Ol Black
Methapyrilene · HCl	A.10	230. blackish P
Morphine	A.10*	166. v. d. b G
Nutmeg	A.10	65. br Black
Opium	A.10*	114. Ol Black
Oxycodone · HCl	A.10	107. m. Ol
Phencyclidine	A.10	7. p. P
STP · HCl (2,5-dimethoxy-4-methylamphetamine)	A.10*	118. deep Y G
TMA · HCl (trimethoxyamphetamine)	A.10*	75. deep y Br
Baking Soda	A.11	181. l. B
Excedrin	A.11	144. l. G
Mace	A.11	120. m. Y G
Pentobarbital	A.11*	222. l. P

Material	Reagent	Final Color (ISCC-NBS)
Phenobarbital	A.11*	222. l. P
Secobarbital	A.11*	222. l. P
Tea	A.11	120. m. Y G
Tobacco	A.11	136. m. y G

* Usual kit reagent for that particular drug.

¹ Color abbreviations used:

B = blue
b = bluish
Br = brown
br = brownish
brill. = brilliant
d. = dark
G = green
g = greenish
Gy = gray

gy. = grayish
l. = light
m. = moderate
med. = medium
O = orange
Ol = olive
P = purple
p = purplish
p. = pale
Pk = pink

pk = pinkish
R = red
r = reddish
s. = strong
V = violet
v. = very or vivid
Y = yellow
y = yellowish

² Aqueous phase.

³ Aqueous phase after chloroform extraction.

⁴ Chloroform phase (marijuana extraction usually rapid compared to other materials).

⁵ Not extracted into chloroform.

⁶ Precipitate.

TABLE 2. Drug Detection Limits and Solvents for Sensitivity Test

Reagent	Drug	Drug Detection Limit, μg	Solvent
A.1	Cocaine · HCl	60.0	CHCl ₃
A.1	Methadon · HCl	15.0	CHCl ₃
A.2	Amobarbital	100.0	CHCl ₃
A.2	Pentobarbital	100.0	CHCl ₃
A.2	Phenobarbital	100.0	CHCl ₃
A.2	Secobarbital	100.0	CHCl ₃
A.3	Marijuana	350 ¹	—
A.4	Codeine Sulfate	5.0	H ₂ O
A.4	D-Amphetamine · HCl	10.0	CHCl ₃
A.4	Heroin · HCl	20.0	CHCl ₃
A.4	D-Methamphetamine · HCl	150.0	CHCl ₃
A.4	Morphine	5.0	CHCl ₃
A.5	Codeine Sulfate	1.0	H ₂ O
A.5	D-Amphetamine · HCl	10.0	CHCl ₃
A.5	Heroin · HCl	10.0	CHCl ₃
A.5	LSD Tartrate	5.0	H ₂ O
A.5	Mescaline Sulfate	1.0	H ₂ O
A.5	Methadon · HCl	1.0	CHCl ₃
A.5	d-Methamphetamine · HCl	5.0	CHCl ₃
A.5	Morphine	5.0	CHCl ₃
A.6	Mescaline Sulfate	1.0	H ₂ O
A.7	LSD Tartrate	5.0	H ₂ O

¹ This quantity of marijuana assumes 0.5% active ingredients.

TABLE 3. Maximum Acceptable Drug Detection Limits for Reagents other than A.1 through A.7

Drug	μg
Cocaine · HCl	600
Codeine Sulfate	50
D-Amphetamine · HCl	100
Heroin · HCl	200
LSD Tartrate	50
Marijuana	1000 ¹
Mescaline Sulfate	10
Methadon · HCl	150
d-Methamphetamine · HCl	500
Morphine	50
Phenobarbital	1000

¹ This quantity of marijuana assumes 0.5% active ingredients.

**TABLE 4. Substances to be Checked in Specificity Test.
(+) Indicates that a Color Reaction Occurs¹**

	Reagent										
	A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10	A.11
Aspirin	—	—	—	+	+	—	—	—	+	—	—
Baking Soda	—	—	—	—	—	—	—	+	—	—	+
Brompheniramine	+	—	—	+	—	—	—	—	—	—	—
Chlorpromazine · HCl	+	—	—	+	+	+	—	—	+	+	—
Contac	—	+	—	+	—	—	—	—	—	—	—
Darvon (propoxyphene · HCl)	+	—	—	+	+	—	—	—	+	+	—
Demerol · HCl	+	—	—	—	+	—	—	—	—	—	—
Doxepin · HCl	+	—	—	+	+	+	—	—	+	+	—
Dristan	—	—	—	+	+	—	—	—	+	+	—
Excedrin	—	—	—	+	+	+	—	+	+	+	+
Librium	+	—	—	—	—	—	—	—	—	—	—
Mace ²	—	—	+	+	+	+	—	—	+	+	+
Marezine (cyclizine · HCl)	+	—	—	—	+	—	—	—	+	+	—
Methapyrilene · HCl	+	—	—	+	+	+	—	—	+	+	—
Methaqualone	—	—	—	+	—	—	—	—	—	—	—
Methyprylon	—	—	—	+	—	—	—	—	—	—	—
Nutmeg ²	—	—	+	—	—	—	—	—	—	+	—
Phencyclidine	+	—	—	—	+	—	—	—	+	+	—
Quinine Sulfate	+	—	—	+	—	—	—	—	—	—	—
Ritalin	+	—	—	+	+	—	—	—	—	—	—
Salt (Iodized)	—	—	—	+	—	—	—	—	—	—	—
Sugar	—	—	—	—	+	—	—	—	—	—	—
Tea, Cut Green ²	—	+	+	—	—	—	—	—	—	—	+
Tobacco	—	—	—	—	—	—	—	—	—	—	+

¹ Substances that gave no colors with these reagents are: D-galactose, glucose, mannitol, oregano, rosemary and thyme.

² Tea, mace and nutmeg interfere with Duquenois test, but not the Duquenois-Levine modified test (A.3).



END